



TRAUMA RADIOLOGY 2024

Trauma: From the Past to the Future



Fausto Labruto
Associate Professor
Director of Emergency Radiology

Handwritten text in Arabic script, likely a manuscript or ledger. The text is written in black ink with several lines of red ink used for headings or emphasis. The script is dense and appears to be a form of accounting or record-keeping. The red ink is used for various purposes, including highlighting specific entries and marking the beginning of new sections. The overall appearance is that of a well-used historical document.

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List of Chapters

Chapter Introduction

List of Blocks

Previous Block

Next Block

Chapter XX

External causes of morbidity and mortality (V01-Y98)

Accidents (V01-X59)

Air and space transport accidents (V95-V97)

V95 Accident to powered aircraft causing injury to occupant

Includes: collision with any object, fixed, movable or moving
crash
explosion
fire
forced landing

V95.0 Helicopter accident injuring occupant

V95.1 Ultralight, microlight or powered-glider accident injuring occupant

V95.2 Accident to other private fixed-wing aircraft, injuring occupant

V95.3 ~~Accident to commercial fixed-wing aircraft, injuring occupant~~

V95.4 **Spacecraft accident injuring occupant**

V95.8 ~~Other aircraft accidents injuring occupant~~

V95.9 Unspecified aircraft accident injuring occupant

Aircraft accident NOS

Air transport accident NOS

Search ICD-10

Full search

OK

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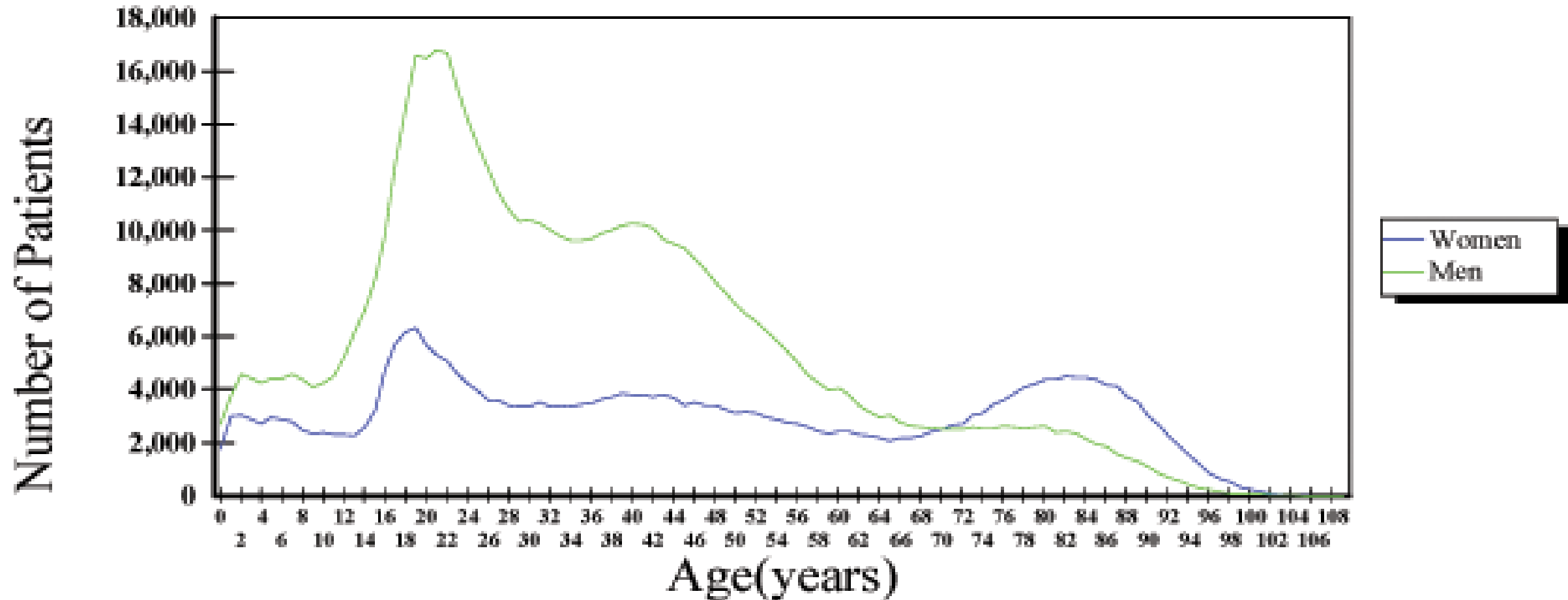
Move to ICD code:

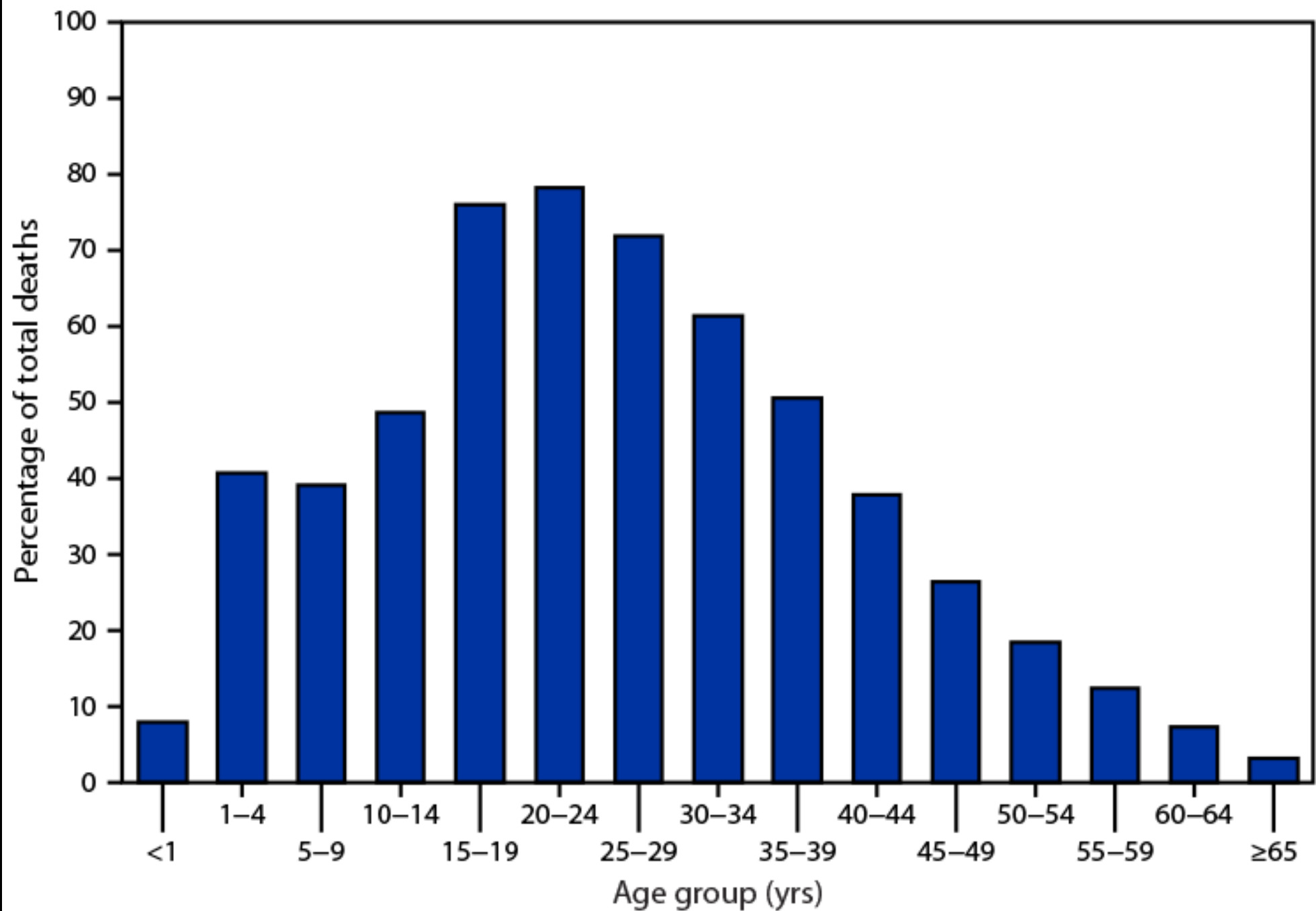






Patients by Age and Gender







Nestor son of Neleus (...) mount your chariot at once; take Machaon with you and drive your horses to the ships as fast as you can. A physician is worth more than many other men put together, for he can cut out arrows and spread healing herbs.

Iliad Book XVI verse 516

“There is a golden hour between life and death. If you are critically injured you have less than 60 minutes to survive.”

R. Adams Cowley



The Trauma Golden Hour

A Practical Guide

Adonis Nasr
Flavio Saavedra Tomasich
Iwan Collaço
Phillipe Abreu
Nicholas Namias
Antonio Marttos
Editors

 Springer

GUEST EDITORIAL

By Bryan E. Bledsoe, DO, FACEP, EMT-P

The Golden Hour: Fact or Fiction?

This whole idea of the so-called “Golden Hour” has always bothered me a little. As a resident, I remember seeing trauma patients rushed to the emergency department by EMS only to lie around for several hours while the surgeons operated on others. Even while staffing a large urban trauma center, I noted that it was uncommon for more than one or two operating rooms to be available during the evening and night hours. I wondered, if EMS has the “Platinum Ten Minutes” and the emergency department has the “Golden Hour,” what do the hospitals and surgeons have? “The Silver Day” or “The Bronze Week”? I remember when I took my first American College of Surgeons Advanced Trauma Life Support Course in 1989, the instructors talked about the trimodal distribution of death following trauma, but kind of joked about the Golden Hour. They implied that it was designed to encourage “ambulance drivers” to get patients to the hospital rapidly so the “real care” could begin. Later, sitting around a table with some emergency medicine physicians, the concept of the Golden Hour came up. I learned from a doctor who trained at the University of Maryland that the whole idea of the Golden Hour was supposedly drafted on a cocktail napkin over drinks in a Baltimore bar.



I learned from a doctor who trained at the University of Maryland that the whole idea of the Golden Hour was supposedly drafted on a cocktail napkin over drinks in a Baltimore bar.

Today, the concept of the Golden Hour has evolved into a fundamental tenet of EMS. The concept of the Golden Hour justifies much of the current EMS and trauma system, not just in this country, but around the world. It is the theoretical basis for such concepts as “load and go” (or “scoop and run,” depending which part of the country you are from). It also forms the fundamental basis for aeromedical transport and trauma center designation. Numerous federal and state grants have been provided to determine how best to deliver patients to trauma centers within the magical Golden Hour. All of the EMS textbooks, including my own, stress the concept of the Golden Hour. We speak and write of it with authority, assuming that it is scientific fact.

It seems intuitive that the sooner trauma patients are delivered to definitive care, the better their chances of survival. But this is not what is at question here. What is not clear is whether the patient must arrive within an hour. Could it be two hours? Could it be 30 minutes? E. Brooke Lerner, EMT-P, and Ronald M. Moscato, MD, with the Department of Emergency Medicine at the State University of New York, Buffalo, decided to look at the medical literature behind the concept of the Golden Hour. In their landmark paper, *The Golden Hour: Scientific Fact or Medical Urban Legend?*, published in the July 2001 issue of *Academic Emergency Medicine*, they performed an

exhaustive search of the medical literature supporting the concept of the Golden Hour. They were able to trace the idea back to famed trauma surgeon R. Adams Cowley, MD, founder of the Shock Trauma Center at the University of Maryland in Baltimore. Dr. Cowley died in 1991, but his writings and documents are archived at the University of Utah. In reviewing the literature, including Dr. Cowley’s writings and archives, Lerner and Moscato were unable to find a single scientific article that either supported or refuted the concept of the Golden Hour. In fact, many of the articles that discussed the Golden Hour



actually referenced other articles where there was no mention of the Golden Hour whatsoever. They summarized, “The intuitive nature of the concept and the prestige of those who originally expressed it resulted in its widespread application and acceptance. Despite the lack of definitive scientific evidence, numerous research studies and requests for funding are based on achieving the Golden Hour for all trauma patients and take for granted that time always matters.”

It is not for me to determine whether the Golden Hour actually exists. Certainly the concept of rapidly getting the patient to the hospital following trauma makes a lot of sense. But, are we risking the lives of EMS personnel in speeding ground ambulances and aeromedical helicopters as they strive to get the trauma patient to a hospital within the Golden Hour when it may not actually exist? Do they risk their lives only to have the patient lie around the emergency department for a prolonged period of time waiting for a surgical team or for an operating suite to become available?

It is incumbent upon us all in emergency medicine and EMS to determine what prehospital time interval is most appropriate. It may be an hour. But, whatever it is, it should be supported by sound, scientific evidence. With a shrinking healthcare dollar, we must be able to prove that everything we do is scientifically and ethically sound. The Golden Hour may not be.

Bibliography

- American College of Surgeons. *Advanced Trauma Life Support Course: Student Manual*, 1995.
- Lerner EB, Moscato RM. The Golden Hour: Scientific Fact or Medical “Urban Legend”? *Acad Emerg Med* 8(7):758–760, 2001. ■

Bryan E. Bledsoe, DO, FACEP, EMT-P, is an emergency physician, EMS author and former paramedic. His writings include Paramedic Care: Principles and Practice, Paramedic Emergency Care and Anatomy and Physiology for Emergency Care. He is a frequent speaker at EMS conferences here and abroad. He resides in Midlothian, TX.

Rapports écrits.

Du shock traumatique dans les blessures de guerre.

I. — *De la distinction dans les états de shock chez les grands blessés, du shock nerveux hémorragique ou infectieux,*

par M. le D^r MOULINIER.

Rapport de M. E. QUÉNU.

II. — *Du rôle joué par l'hémorragie dans l'apparition du shock traumatique,*

par M. P. SANTY,

Prosecteur à la Faculté de Lyon.

Rapport de M. E. QUÉNU.

La mortalité globale est de :

10 p. 100 à la 1^{re} heure.

11 p. 100 à la 2^e heure.

12 p. 100 à la 3^e heure.

36 p. 100 à la 4^e heure.

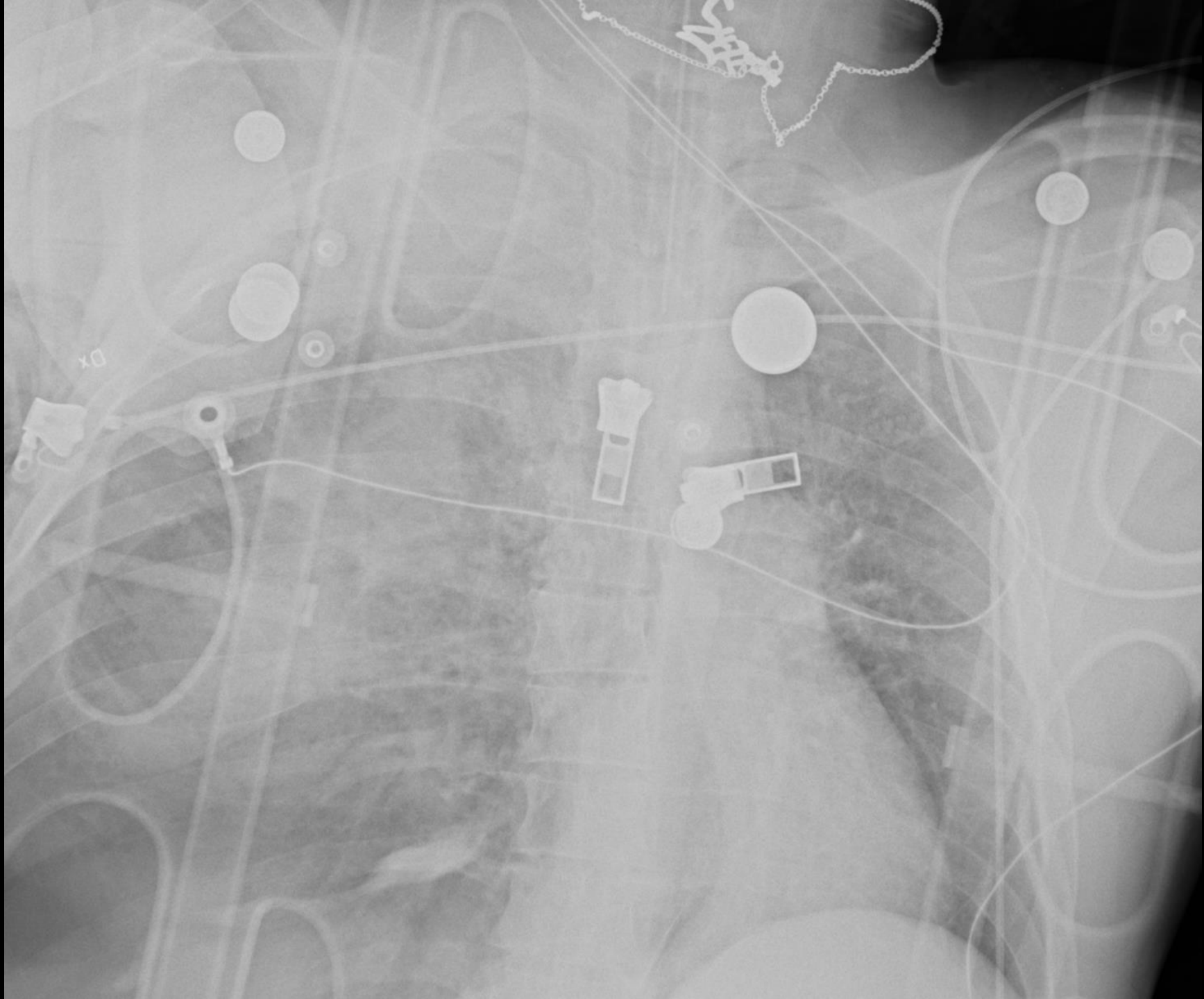
33 p. 100 à la 5^e heure.

41 p. 100 à la 6^e heure.

75 p. 100 à la 8^e heure.

75 p. 100 aux 9^e et 10^e heures.





THE DISCOVERY OF A BULLET LOST IN
THE WRIST BY MEANS OF THE
ROENTGEN RAYS.

BY ROBERT JONES, F.R.C.S. EDIN.,

HONORARY SURGEON TO THE ROYAL SOUTHERN HOSPITAL, LIVERPOOL;

AND

OLIVER LODGE, F.R.S.,

PROFESSOR OF PHYSICS, UNIVERSITY COLLEGE, LIVERPOOL.

A BOY aged about twelve years was brought to me by Dr. Simpson of Waterloo, Liverpool, having shot himself in the left hand just above the deep palmar arch. The wound



ing from each point of the glass in all directions. The boy was comfortably seated at a table with his palm down on an aluminium-protected Edwards' isochromatic half-plate, nine inches vertically below the vacuum tube, and rather **more than two hours' exposure was given.** The coil used was an



A Prospective Study of Surgeon-Performed Ultrasound as the Primary Adjuvant Modality for Injured Patient Assessment

Rozycki, Grace S. MD, FACS; Ochsner, M. Gage MD, FACS; Schmidt, Judy A. RN, DNSc; Frankel, Heidi L. MD; Davis, Thomas P. MC, USNR; Wang, Dennis MD; Champion, Howard R. FRCS (Edin)

[Author Information](#) ☺

The Journal of Trauma: Injury, Infection, and Critical Care 39(3):p 492-500, September 1995.

ULTRASONIC SCANNING IN THE DIAGNOSIS OF SPLENIC HAEMATOMAS

J. Kvist Kristensen, B. Buemann and E. Kühl

*From Department of Surgery H (Heads: P. A. Gammelgaard, F. R. Mathiesen & B. L. Sørensen),
Department of Surgery S (Head: A. Gammeltoft), and the Department of Radiology (Heads:
O. Petersen, M. Eiken & S. Brünner), Gentofte Hospital, DK 2900 Hellerup, Denmark*



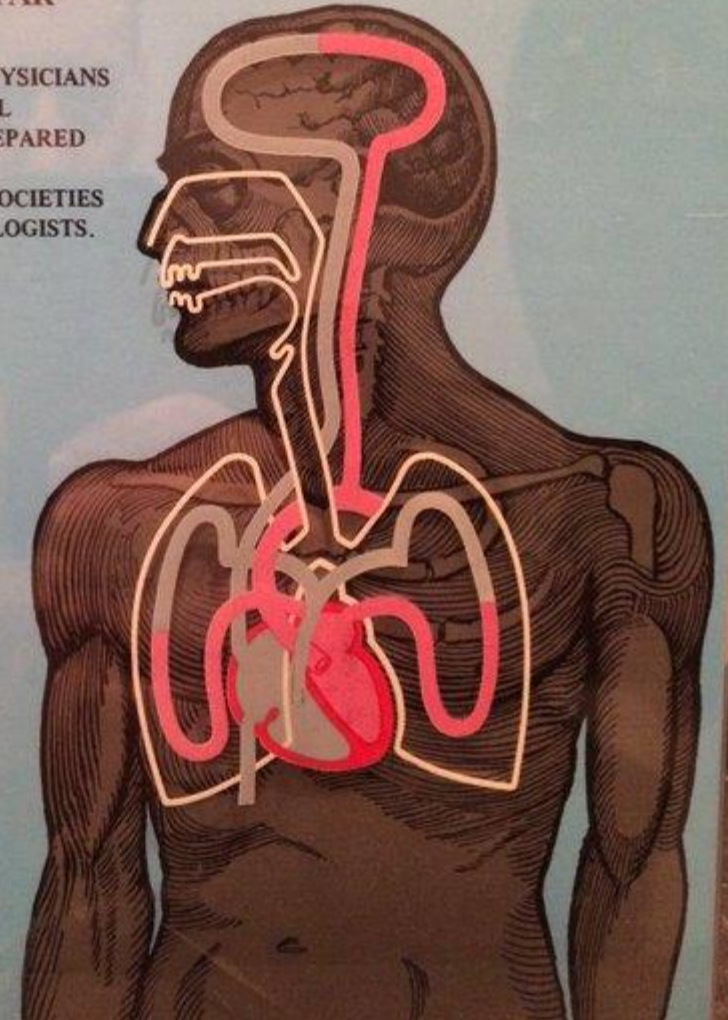


ABC

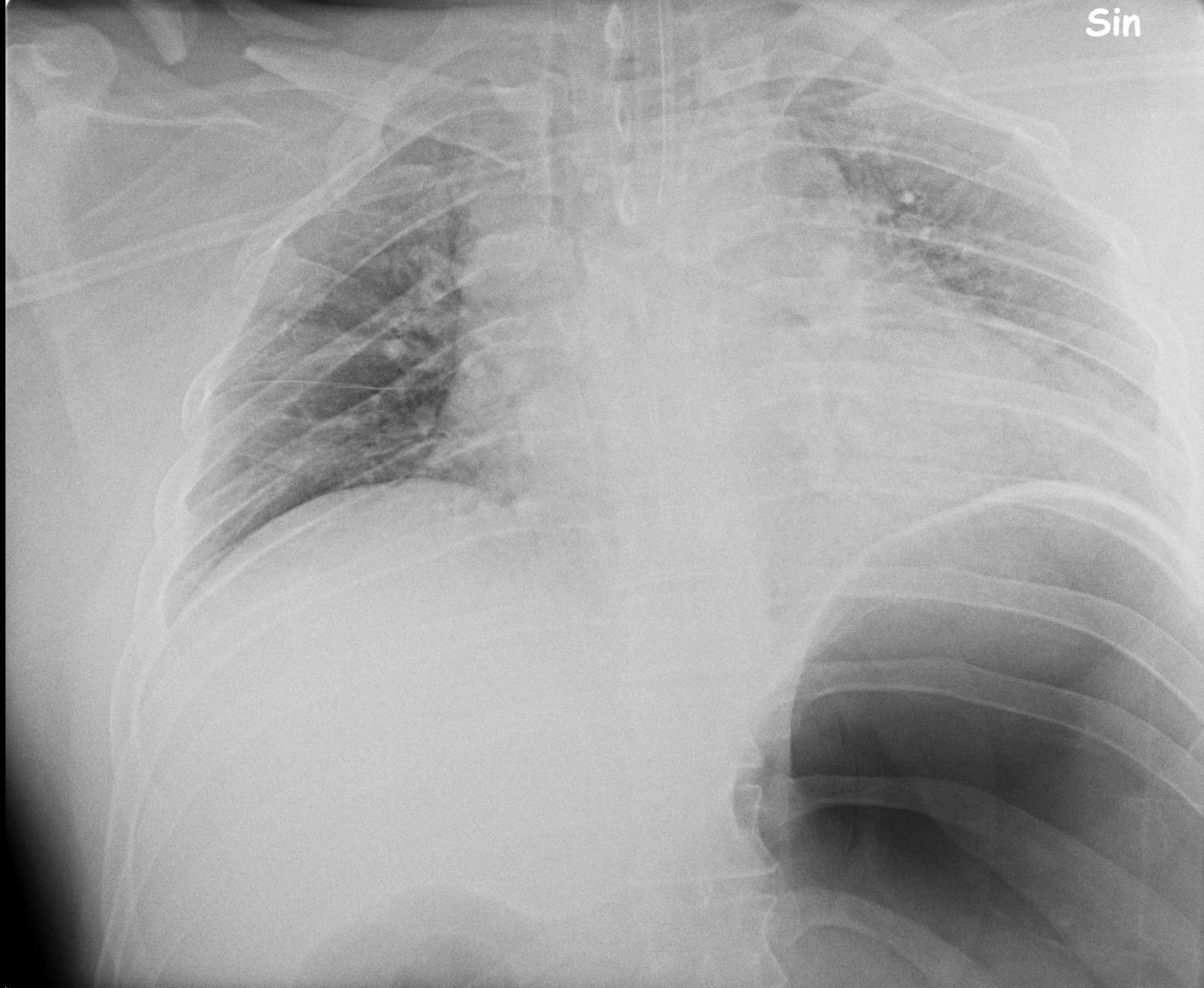
CARDIOPULMONARY CEREBRAL RESUSCITATION

BY PETER SAFAR

A MANUAL FOR PHYSICIANS
AND PARAMEDICAL
INSTRUCTORS, PREPARED
FOR THE WORLD
FEDERATION OF SOCIETIES
OF ANAESTHESIOLOGISTS.



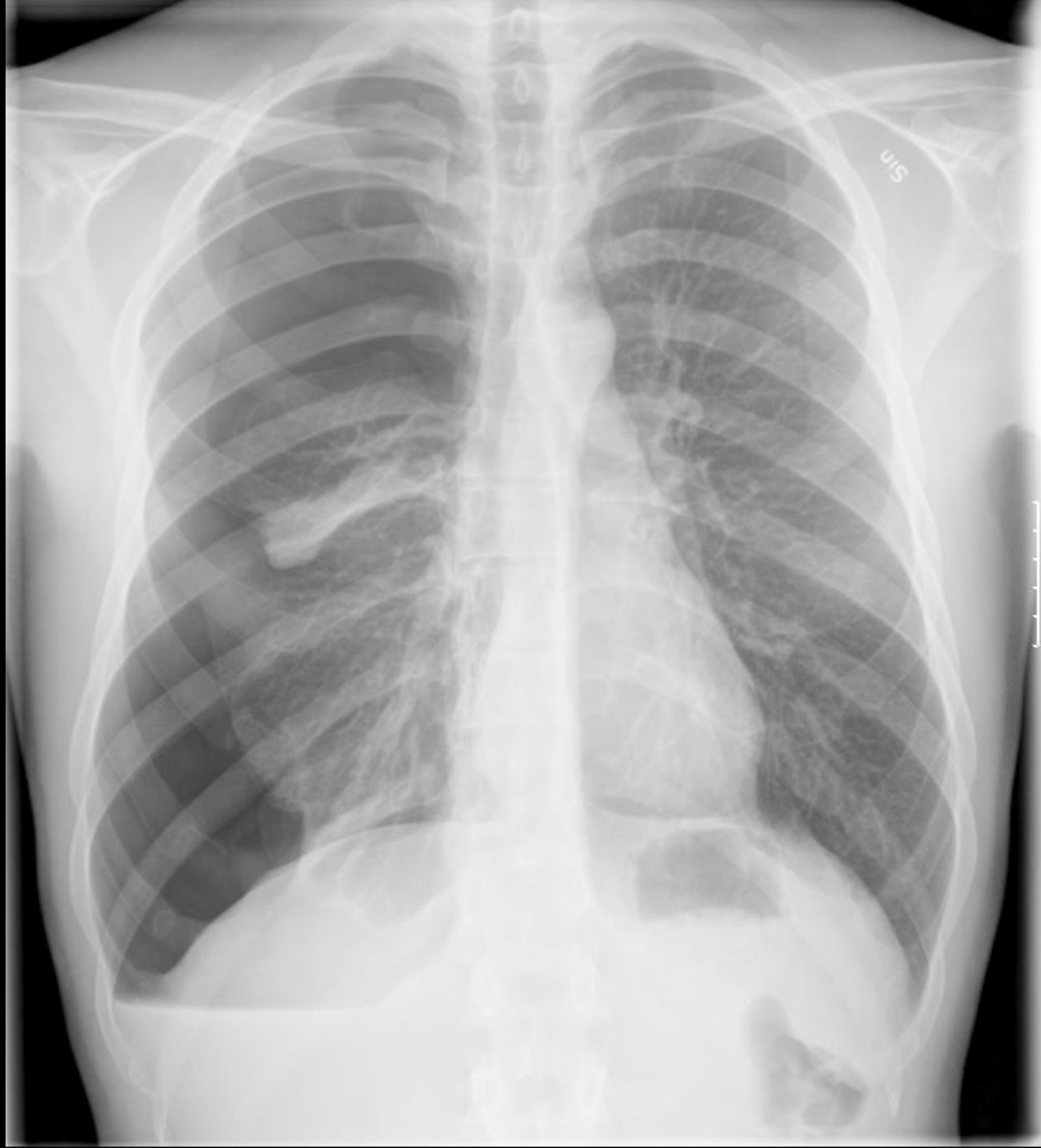
A **B** **C**



Handwritten text in a cursive script, likely a medical or anatomical treatise, written in red and black ink on aged paper.

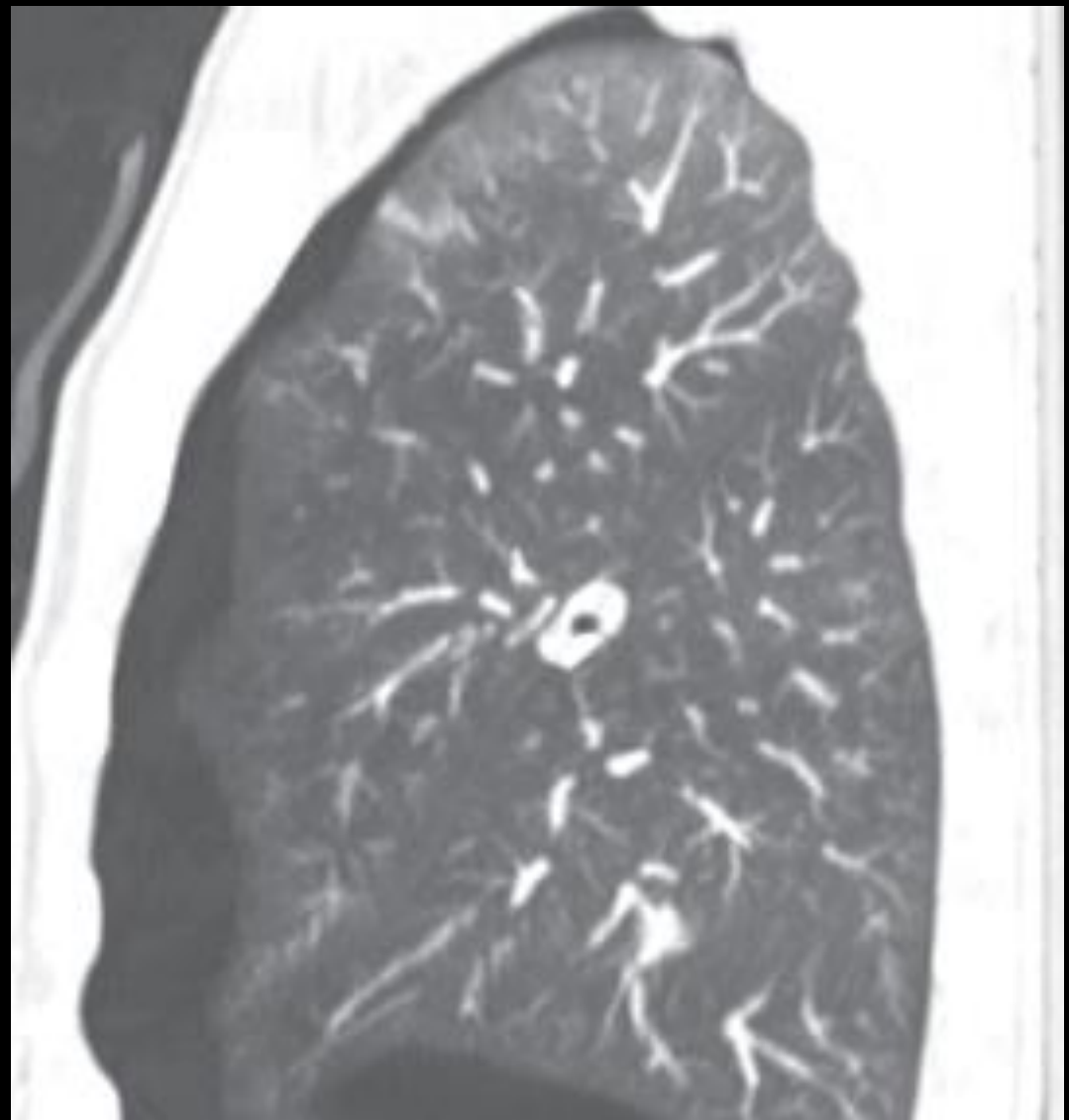


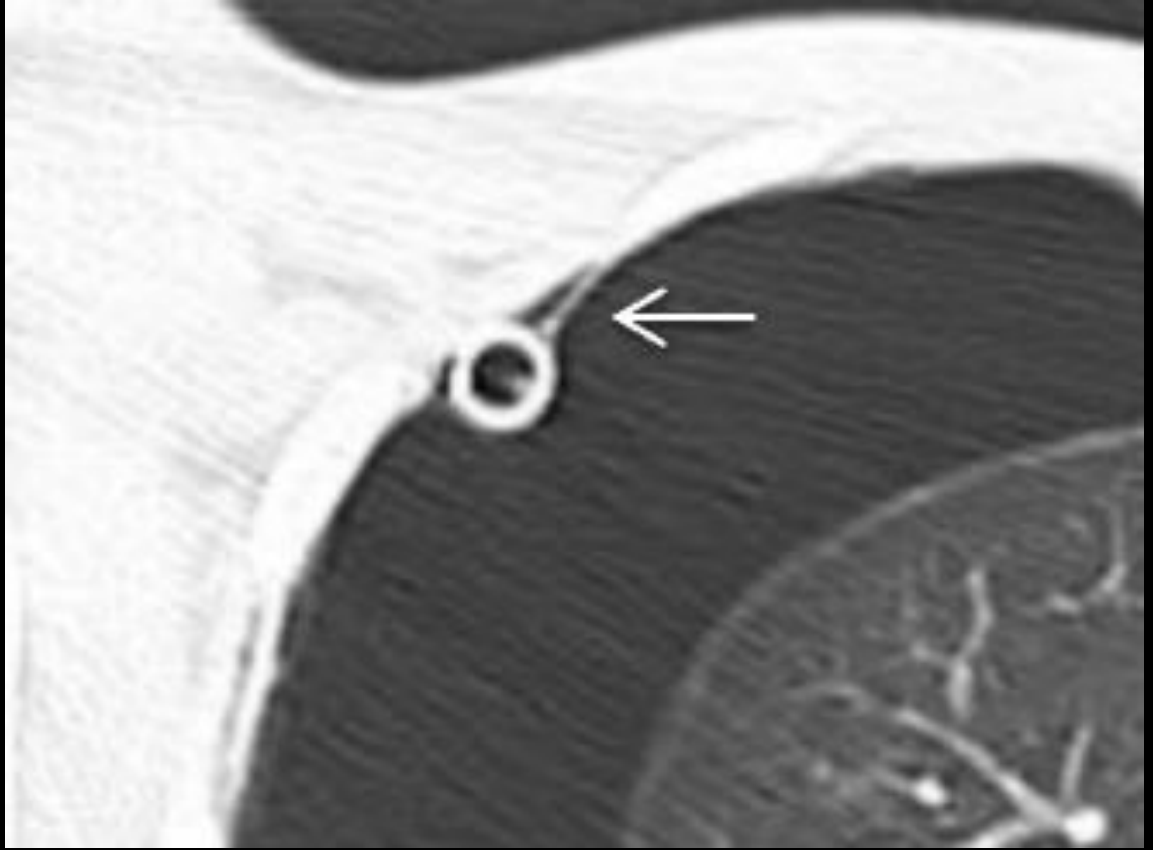
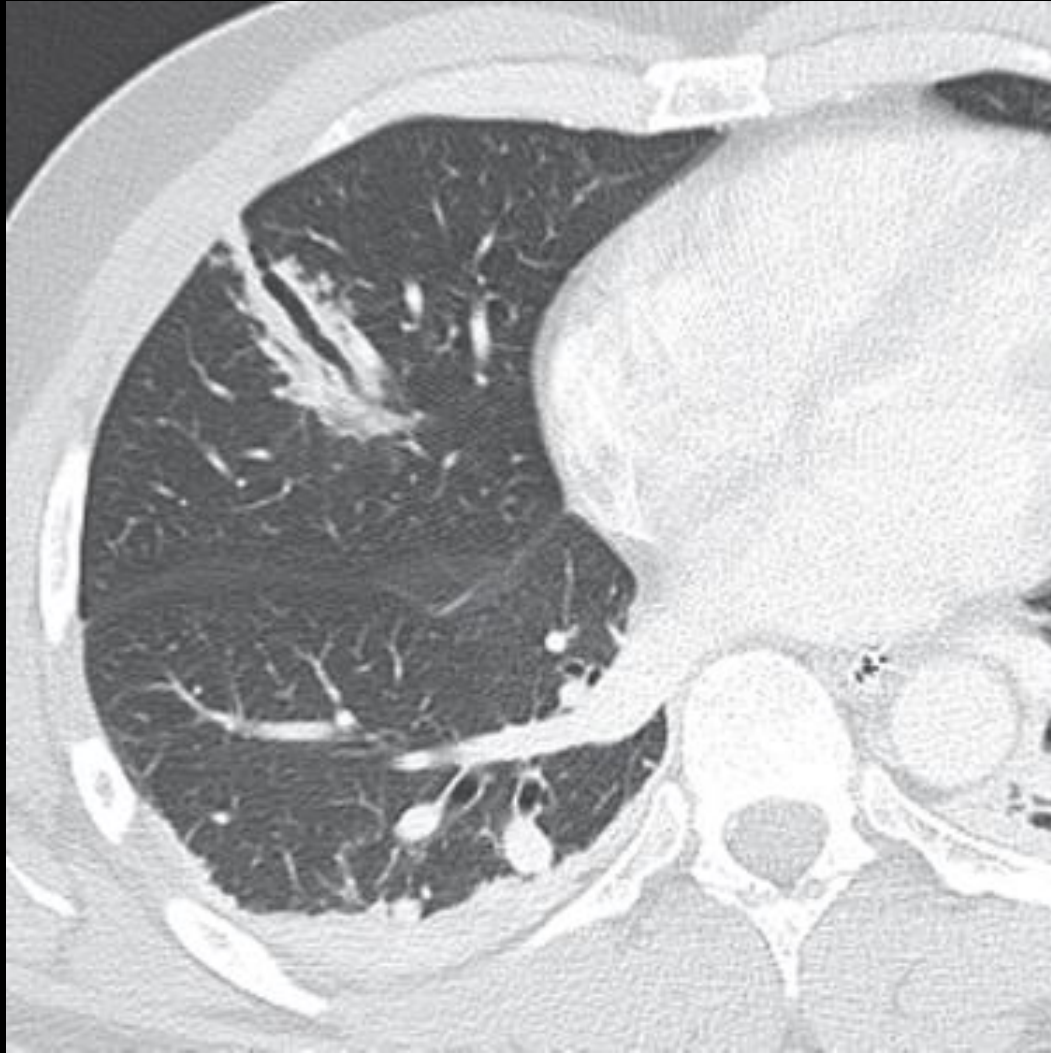
SEPTIMA musculorum tabule laxata sine à quo inter pingendū pendebat, in posteriori oratione praedit, quatuor reflexio tam perueniens, & omnibus quae illo amplexantur, videnda septo transuerso sustinetur, quod etiam in praesenti tabula ad sinistram eam forma apponitur, quae cunctam, paritè, suo lentore hinc rem, nobis apparuit. Quo minus autem dextra scapula, effracta ale ritis deorsum decumberet, illam iunctura sua suspensimus, ut inuicem ipsius causam in conspectu sit.

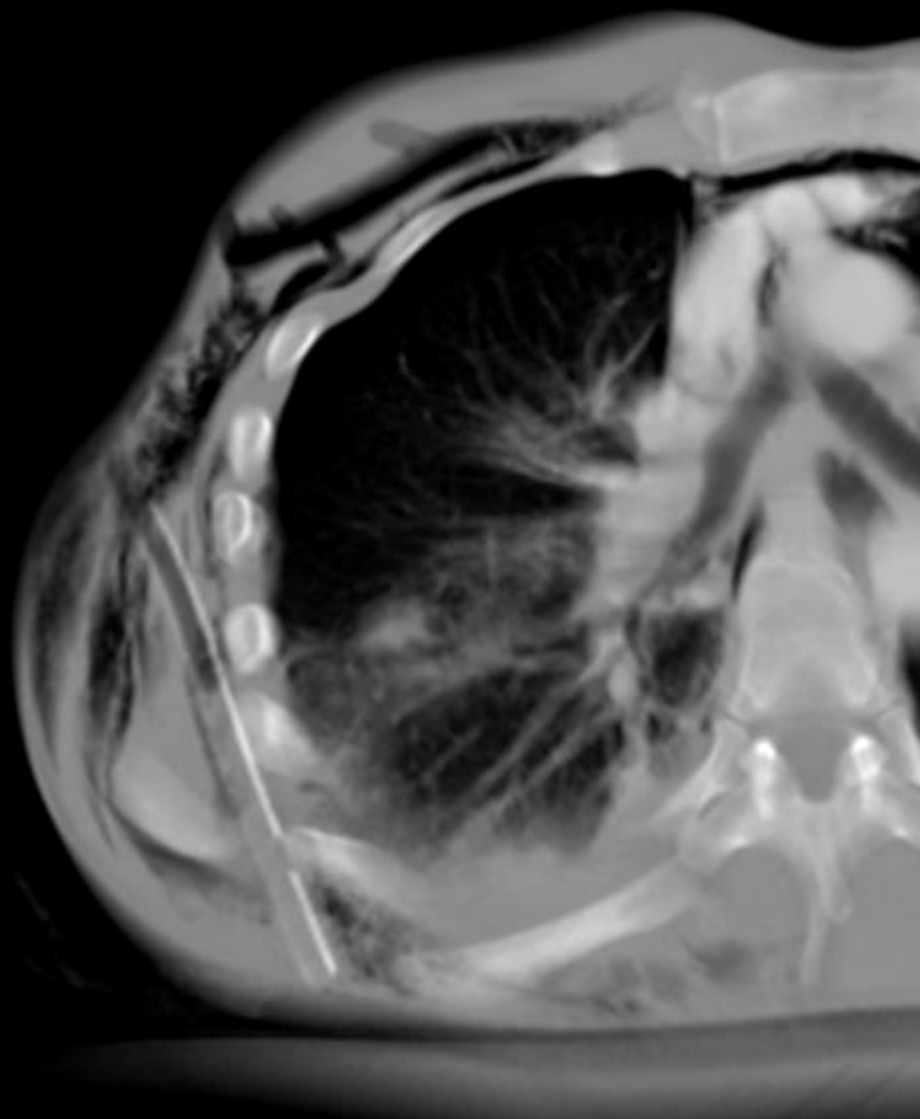


A B C

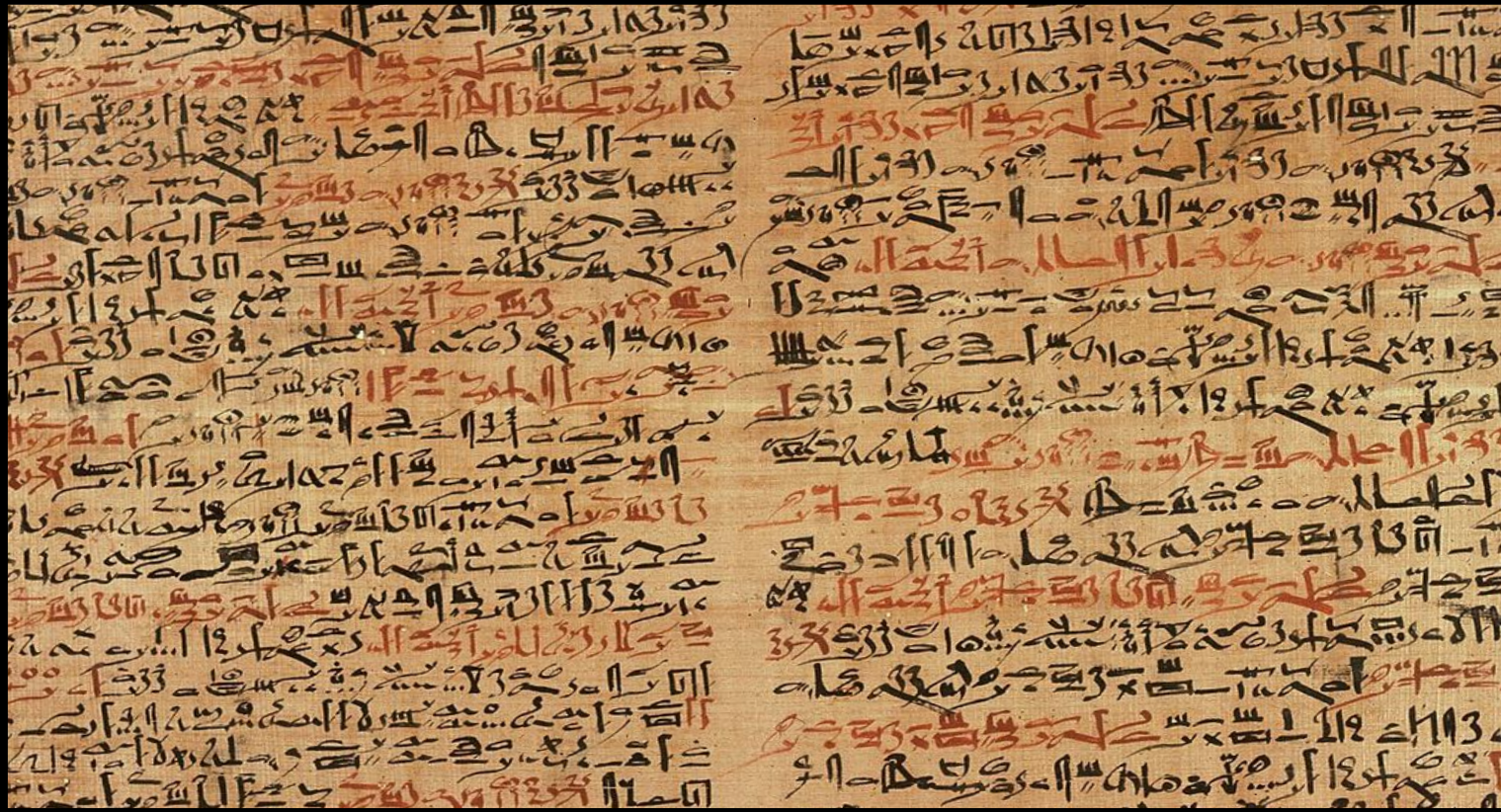












If you encounter a man having a wound in his breast, penetrating to the bone with perforation of the manubrium of the sternum, you should press the manubrium of the sternum with your fingers, even though he shudders exceedingly

Case 40, Edwin-Smith papyrus

222
dax er sich pulde wapernde drin.
nu wil er werbn nitwen pin.
Do der fräden flvhtech man.
het alsin barnas an.
er satelz orf mit siner hant.
sette vnt sper bereit er vant.
man horte sine reise sinorgen chlag.
do er danuen seiet do begynde chagn.
Hil hvre del hat vdroxen.
den dix mare was vor be-
floxzen. hvige chvndenz
nie eruarn. By wil ich dax
nibt langer sparn.
ich hvre iv chvnt mit
rehter sage. wand ich in dem mvrde
muge. dax sloz dirre aventvire.
wi der hvre vnt der gehvire.
anfortas wart wol gelvnt.
vnt tve div aventvire chvnt.
wi von Pelmpete div kvriegin.
ir chvnden wplichen sin.
behiet vnt an ir louf stat.
da si in hohe selde trat.
Parzival dax wurbet.
ob min chvnt nibt verdurbet.
ich sage alrest sin arbeit.
swax sin hant ie gestreit.
dax was mit kunden her gezan.
mohte ich diss marres wandel han.
vngern wolt ich in wagen.
des chvnde och mich betagen.
N bevill ich sin gelveke.
sime herren der selden hvche.
da div vntvel in der chvnt lach.
wandez nie zaghet gepflach.
dax mvrte in vestenunge gebn.
dax er behalde nvsin ledn.
sit er sich hat an den gezogt.
in bestet ob allen streie an vogt.
f siner vnterzaggen reise.
der selbe kvrtze.
was ein heidniscer man.
der tveit chvnde nie gewan.
Parzival rar halde.
gen aine grozen walde.
vf einer liechten wuste.
gen aine richen gaste.
er ut vnder ob ich armer man.
di richet iv gelagen chan.
di der heiden fvr zimerte tvech.
sage ich del mere denne grvch.
dennoch mag ich iv mer wol sagin.
wil ich siner richet nibt gedagn.
Swax diende artos hant.

ce Bertane vn in lugellant.
dax vergotte nibt di streie.
di mit edelen arde reite.
lagen vf del helder wapenroch.
der was tivre an al getroch.
Kobbine Calcedone.
waren da ceswachem lone.
der waperoch gap planchen sein.
in dem berge zAgrenvntin.
di weme Salamander.
in wvrtren zeinander.
in dem heizen hvre.
di waren stane tivre.
lagen drvf tvechel vnd lieht.
ir art mag ich benennen nibt.
in gr hvnt nach mvrne.
Svnt nach priff gewunne.
dax gaben och allex maestech wip.
da mite der heiden sinen lip.
choftenliche zimerte.
div mvrne Condwerte.
in sin manlich herce hohen mvr.
al si noch dem manne gernden tve.
Er tveg och drvf priff lon.
vf dem helme ein leidemon.
swelhe weme sine arcbast.
von del selbn tierlung chraft.
hant si lebens dechene vriff.
swemex von in erimechet ut.
Thopedustimonte.
vnt allger zionte.
Thasine vnd Ambr.
sint vor solhem pfalle vri.
al sin orf tvech covervire.
der vngedste gehvire.
manch nach wibe lone.
del zimert er sich svs scone.
sin hohez herce in del berwanch.
dax er nach weider mvrne ranch.
Der selbe werliche knabe.
het in einer wilden habe.
zem foreht ganzert vf dem mer.
er hete svnt vnt xweinzoch her.
der nehenex sanden rede vernam.
al siner richet wol gezam.
HIs manoch forder lant.
diende siner werden hant.
More vnd ander Saffazine.
mit vngleichem seine.
in sinen vnt gelammem her.
was manoch wnderlich w.
Och reit nach Aventvire dan.
von sine her dirre aine man.
dvrch paneken in foreht.

*There lay a man pierced through, with his blood
rushing inward (...)*

*"He is not mortally wounded. The blood is only
pressing on his heart."*

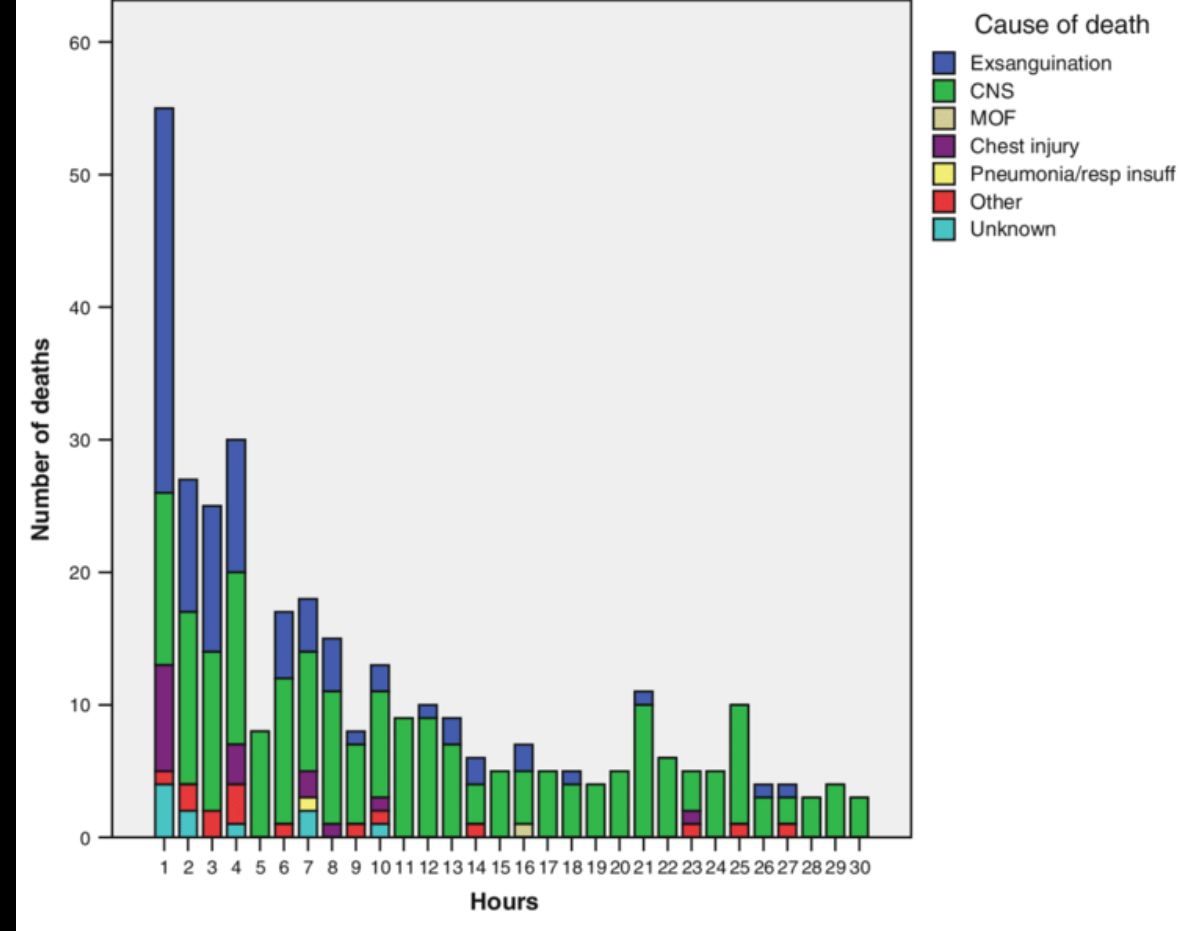
*He grasped a branch of the linden tree, slipped
the bark off like a tube (...) and inserted it into
the body through the wound.*

*Then he bade the woman to suck on it until blood
flowed toward her. The hero's strength revived so
that he could speak and talk again.*

Von Eschenbach, Parzival

ABC





χειρὶ δ' ἔλὼν ἐπίεζε βραχίονα

”... And holding with his hand he pressed on the arm”

Homer, Iliad, Book XVI verse 510

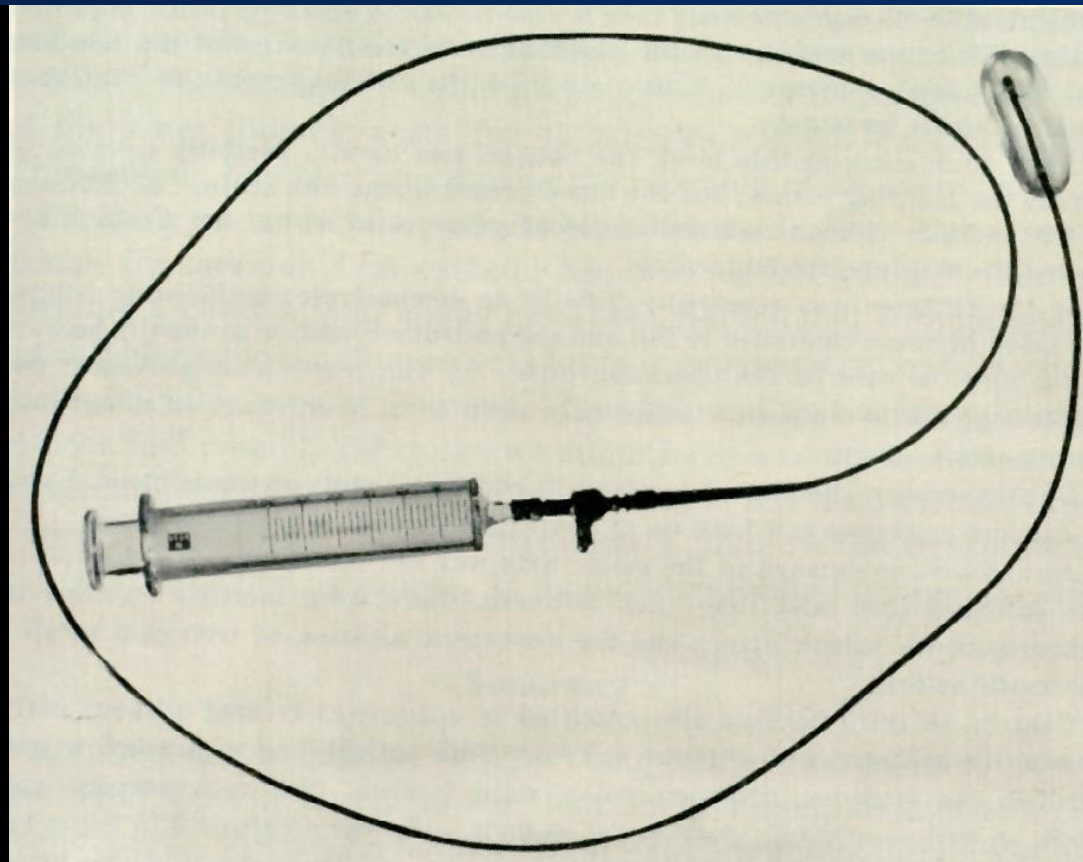




REBOA

Use of an intra-aortic balloon catheter tamponade for controlling intra-abdominal hemorrhage in man

Lieutenant Colonel Carl W. Hughes







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